

CLAIMS

1. A method of producing a compact microarray using a printhead having a plurality of pins, comprising:

loading said pins with material to be deposited on a substrate;

selectively depositing material in a predetermined active area of said substrate using a subset of two or more of said pins in said printhead;

selectively depositing material in said predetermined active area of said substrate using another subset of two or more of said pins in said printhead;

wherein said printhead has a footprint, defined by the periphery of the pins in the printhead, that is larger than said predetermined active area of said substrate.

2. The method of Claim 1 wherein loading said pins with material comprises dipping said pins in one or more wells of liquid material.

3. The method of Claim 1 wherein selectively depositing material in a predetermined active area of said substrate using a subset of said pins in said printhead comprises bringing tips of said subset of said pins in contact with the active area of the substrate while inhibiting contact between said substrate and tips of other pins in the printhead.

4. The method of Claim 1 wherein selectively depositing material in a predetermined active area of said substrate using a subset of said pins in said printhead comprises moving the printhead to a first location over the substrate so that said subset of the pins is disposed over said active area of the substrate and said another subset of said pins is not disposed over the active area; and lowering the printhead and allowing said subset of pins to contact the substrate while inhibiting said another subset of pins from contacting the substrate.

5. The method of Claim 4 wherein inhibiting said another subset of said pins from contacting the substrate comprises lifting said another subset of pins relative to the printhead.

6. The method of Claim 5 wherein lifting said another subset of pins comprises raising said pins using electromagnetic force.

7. The method of Claim 6 wherein using electromagnetic force comprises using electromagnetic force to attract said pins across a gap between said pins and one or more electromagnets.

8. The method of Claim 5 wherein lifting said another subset of pins comprises raising said pins using suction.

9. The method of Claim 5 wherein lifting said another subset of pins comprises raising said pins using a mechanical lifter.

10. The method of Claim 5 wherein lifting said another subset of pins comprises raising said pins using a pneumatic actuator.

11. The method of Claim 5 wherein lifting said another subset of pins comprises lifting a support on which said another subset of pins can rest.

12. The method of Claim 1 wherein said subset of pins or said another subset of pins comprises a row of pins.

13. The method of Claim 1 wherein said subset of pins or said another subset of pins comprises a generally rectangular array of pins.

14. An apparatus for producing a compact microarray, comprising:  
  
a printhead having a plurality of pins movably mounted therein, said pins being arranged in subsets of two or more pins; and  
  
a plurality of pin lifting mechanisms, each associated with a different one of said subsets for lifting the pins of the subset together relative to the printhead.

15. The apparatus of Claim 14 wherein said printhead comprises a member having a plurality of through holes extending therethrough, and wherein each pin is slidably mounted in one of said through holes.

16. The apparatus of Claim 14 wherein said pin lifting mechanisms each include an electromagnet.

17. The apparatus of Claim 14 wherein said pin lifting mechanisms each include a pneumatic actuator.

18. The apparatus of Claim 14 wherein said pin lifting mechanisms each include a support for supporting pins and an actuator for lifting said support.

19. The apparatus of Claim 14 wherein said pin lifting mechanisms each raise pins using suction.

20. The apparatus of Claim 14 wherein a subset comprises a row of pins.

21. The apparatus of Claim 14 wherein a subset comprises a generally rectangular array of pins.